

What is claimed is:

1. A mass spectrometry process for analyzing substance mixtures  
5 using a triple quadrupole mass spectrometer, said substance mixtures being ionized before the analysis, which comprises the following steps:
  - 10 a) selecting a mass/charge quotient ( $m/z$ ) of an ion formed by ionization in a first analytical quadrupole (I) of the mass spectrometer,
  - b) fragmenting the ion selected under (a) by applying an  
15 acceleration voltage in a further following quadrupole (II) which is filled with a collision gas and functions as a collision chamber,
  - c) selecting a mass/charge quotient of an ion formed by the  
20 fragmentation (b) in a further downstream quadrupole (III), the process steps (a) to (c) being run through at least once, and
  - d) analyzing the mass/charge quotients of all ions present  
25 in the substance mixture as a result of the ionization, the quadrupole (II) being filled with collision gas but no acceleration voltage being applied during the analysis;

30 and the steps (a) to (c) and step (d) may also be carried out in reverse sequence.
2. The process according to claim 1, wherein the ionization of  
35 the substance mixture is upstream of a chromatographic separation.
3. The process according to claim 1 or 2, wherein the  
chromatographic separation is an HPLC separation.
4. The process according to claims 1 to 3, wherein steps (a) to  
40 (d) are run through at least once within from 0.1 to 10 seconds.

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Figures

5. The process according to claims 1 to 4, wherein steps (a) to (d) are run through at least once within from 0.2 to 2 seconds.
- 5 6. The process according to claims 1 to 5, wherein the ionization is effected by evaporating the substance mixture and ionizing in the gas phase, by desorbing the substance mixture on a surface or by atomizing the substance mixture in an electrical field.
- 10 7. The process according to claims 1 to 6, wherein the ionization is effected by atomizing the substance mixture in an electrical field.
- 15 8. The process according to claims 1 to 7, wherein analysis is effected in step (a) between 1 and 100 mass/charge quotients of different ions formed by ionization and selected.
- 20 9. The process according to claims 1 to 8, wherein the substance mixture is of biological or chemical origin.
10. The process according to claims 1 to 9, wherein the substance mixtures are derivatized before the analysis or before the chromatographic separation according to claim 2 or 3.
- 25 11. The process according to claims 1 to 10, which is carried out manually or automatically.
12. The process according to claims 1 to 11, which is used in a high-throughput screening.
- 30 13. The process according to claims 1 to 12, wherein the fragment ion analyzed in step (c) and the (m/z) quotients, analyzed in step (d), of all ions present in the substance mixture or the fragment ion analyzed in step (c) or the (m/z) quotients, analyzed in step (d), of all ions present in the substance mixture are quantified.
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# Mass spectrometry process for analyzing substance mixtures

## Abstract

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A mass spectrometry process for analyzing substance mixtures using a triple quadrupole mass spectrometer, said substance mixtures being ionized before the analysis, which comprises the following steps:

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a) selecting a mass/charge quotient ( $m/z$ ) of an ion formed by ionization in a first analytical quadrupole (I) of the mass spectrometer,

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b) fragmenting the ion selected under (a) by applying an acceleration voltage in a further following quadrupole (II) which is filled with a collision gas and functions as a collision chamber,

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c) selecting a mass/charge quotient of an ion formed by the fragmentation (b) in a further downstream quadrupole (III), the process steps (a) to (c) being run through at least once, and

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d) analyzing the mass/charge quotients of all ions present in the substance mixture as a result of the ionization, the quadrupole (II) being filled with collision gas but no acceleration voltage being applied during the analysis;

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and the steps (a) to (c) and step (d) may also be carried out in reverse sequence.

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